

152 MM XM150 Gun in M60A1E2

1. A modified version of the "KE" Gun XM150 can be adapted to the present M60A1E2 turret. This will require that the breech mechanism be modified to roll over to the left similar to the XM162 gun that is now in the M60A1E2. The breech of the XM150 gun rolls over to the right and it will hit the tracker/telescope. A new gun cradle, gun shield, and recoil mechanism will be required. The recoil mechanism will be similar to the M60A1E2 but it will have a longer recoil length. The required bracket, buffer housing, recoil loop bracket, etc. will have to be designed to meet the new gun configuration.
2. The gun will be located as shown on LO 9592 to provide loading clearance between the breech and the commander's station. The loading space for ammunition will be the same as on the present M60A1E2 and should not affect loading since the "KE" round is shorter than the missile.
3. The larger gun and recoil mechanism will increase the unbalance condition three times that of the present M60A1E2. This unbalance condition will require a new elevating/equilibrators assembly. The elevating mechanism will be in the same area as the present M60A1E2. An auxiliary equilibrators can be located forward of the present elevating mechanism. The location of the center of gravity of the complete turret assembly has moved from 0.7 inches behind the turret line for the M60A1E2 with the XM162 gun/launcher to 2.8 in. in front the turret centerline with the XM150 gun. The gun mount assembly inertia about the trunnion centerline and the XM150 turret inertia have increased to 2,094 and 24,654 slug ft.<sup>2</sup> respectively. 90,000  
IS  
30,000
4. The left side of the gun mount will become more congested due to the auxiliary equilibrators.
5. The telescope tracker will remain the same except for the change of the ballistic reticle.
6. The hull and turret ammunition racks will have to be changed to accommodate the KE round which has a different shape and length as compared to the ammunition required for the XM162 gun. The hull ammo rack can be revised to accommodate three "KE" rounds and the turret 6-round vertical rack revised to accommodate two "KE" rounds. An additional thirteen (13) "KE" can be stowed in the hull and turret in place of the missile rounds by the use of adapters.
7. The sighting equipment will remain the same except for new ammunition packs for the computer to accommodate the different external ballistic characteristics of the XM150 gun and ammunition.
8. The XM150 gun assembly will not interfere with any of the present components if the breech rolls to the left.
9. The XM150 air scavenger system on the MBT-70 does not go through any pressure wall on the gun as it does on the XM162. The volume of air used per round on the MBT-70 is less than that required on the present M60A1E2. Changes will be required to the air scavenger system in the gun mount area.

## 105 MM M68 in M60A1E2

1. The gun and recoil mechanism will be similar to the M60A1. The gun shield will be new to mate with the existing turret and trunnion bearings. The required torque brackets, co-axial gun mounting, etc. will have to be designed to meet the new gun configuration.
2. The gun will be located as shown on LO 7569 to provide loading clearance between breech and commander's station. A bang plate or shield located in front of the commander's platform will protect the commander against the ejected ammunition cases.
3. The larger gun and recoil mechanism will increase the unbalance condition three times that of the present M60A1E2. This unbalance condition will require a new elevating/equilibrating assembly. The elevating mechanism will be in the same area as the present M60A1E2. An auxiliary equilibrating can be located forward of the present elevating mechanism. The location of the center of gravity of the complete turret assembly has moved from 0.7 inches behind the turret line for the M60A1E2 with the XM4162 gun/launcher to 2.5" in front of the turret centerline with the M68 gun. The gun mount assembly inertia about the trunnion centerline and the turret inertia have increased to 2,724 and 25,331 slug ft.<sup>2</sup> respectively.
4. The left side of the gun mount will be congested due to the co-axial machine gun, feed chute, link ejection chute, spent brass bag, breech operating handle, breech operating cam, and the elevation/equilibrating assembly.
5. The telescope/mount will be different because no tracker is required, there is an interference with the breech assembly and the fixed position of the gunner. New ballistic reticle required.
6. The ammunition stowage in the hull will be the same as on the M60A1 but new stowage will have to be provided in the turret.
7. New ammunition pack for the computer to drive the gunner's and commander's periscope will be required.
8. The M68 gun interferes with the present loader panel, the gunner's control unit, the gunner control panel, the co-axial machine gun, and the telescope.

## 120MM T123E6 GUN IN M60A1E2

- The gun will be mounted in the turret by a new recoil mechanism which is similar in design to the M60A1E2. The complete gun mount including the gun shield will be new. The existing trunnion bearings will be the same. The required torque bracket, buffer housing, guards, co-axial gun mounting, etc. will have to be designed to meet the new gun configuration.
- The gun will be located as shown on LO 10063 to provide loading clearance between the breech and commander's station. A bang plate or shield located in front of the commander's station will protect the commander against the ejected ammunition cases.
- The larger gun and recoil mechanism will increase the unbalance condition more than five times that of the present M60A1E2. This unbalance condition will require a new elevating/equilibrators assembly. The location of the elevating mechanism will be in the same area as the present M60A1E2. An auxiliary equilibrators can be located forward of the present elevating mechanism. The location of the center of gravity of the complete turret assembly has moved from 0.7 inches behind the turret centerline for the M60A1E2 with the XM162 gun/launcher to 6.6 inches in front of the turret centerline with the T123E6 gun. The inertia of the gun mount assembly about the trunnion centerline and the inertia of the turret have increased to 10,960 and 38,400 slug ft.<sup>2</sup> respectively.
- The left side of the gun mount will be congested due to the co-axial machine gun, feed chute, link ejection chute, spent brass bag, increased recoil cylinder diameter, larger breech assembly, breech operating handle, breech operating cam and the elevation/equilibrators assembly.
- The telescope/mount will be different because the tracker is not required, there is an interference with the breech assembly and the fixed position of the gunner. New ballistic reticle is required.
- The ammunition stowage will be completely different in the hull and turret. The T123E6 gun has two piece ammunition. The charge is in a metal case.
- New ammunition packs for the computer to drive the gunner's and commander's periscopes will be required.
- The T123E6 gun interferes with the present location of the data link syncro motor, the telescope, the gunner's control unit, the gunner's control panel, the loader's panel and the turret roof.

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## 120MM L11A2 GUN IN M60A1E2

The gun will be mounted in the turret by new recoil mechanism which is similar in design to the M60A1E2. The complete gun mount including the gun shield will be new. The existing trunnion bearing will be the same. The required torque bracket, buffer housing guards, coaxial gun mounting, etc. will have to be designed to meet the new gun configuration.

The gun will be located as shown on LO 10064 to provide loading clearance between the breech and commander's station. The gun uses a bagged charge therefore no shield is required to protect the commander against ejected ammunition cases.

The larger gun and recoil mechanism will increase the unbalance condition five times that of the present M60A1E2. This unbalance condition will require a new elevating/equilibrators assembly. The elevating mechanism will be in the same area as the present M60A1E2. An auxiliary equilibrators can be located forward of the present elevating mechanism. The location of the center of gravity of the complete turret assembly has moved from 0.7 inches behind the turret line for the M60A1E2 with the XM162 gun/launcher to 5.5 inches in front of the turret centerline with the L11A2 gun. The gun mount assembly inertia about the trunnion centerline and the turret inertia has increased to 8,460 and 34,900 slug ft.<sup>2</sup> respectively.

The left side of the gun mount will be congested due to the coaxial machine gun, feed chute, link ejection chute, spent brass bag, increased recoil cylinder diameter, larger breech assembly and the elevation/equilibrators assembly.

The telescope/mount will be different because no tracker is required. There is an interference with the breech assembly and the fixed position of the gunner. New ballistic reticle required.

The ammunition stowage will be completely different in the hull and turret. The L11A2 gun has two piece ammunition with the charge being completely consumable.

New ammunition packs for the computer to drive the gunner's and commander's periscope will be required.

The L11A2 gun interferes with the present location of the data link syncro motor, the telescope, the horizontal ammunition rack, the coaxial machine gun, gunner's control unit and the loader's panel.

# COMB. GUN MOUNT & TURRET CHARACTERISTICS

WEAPON		152MM. XMI50	105MM M68	120MM LIIA2	120MM TI23E6
COMB. GUN MOUNT WT.	LBS.	6380	5535	7886	8030
COMB. GUN MOUNT UNBALANCE	LB. INS.	90,089	95,000	130,000	166,000
COMB. GUN MOUNT INERTIA ABOUT TRUNNION	SLUG FT. <sup>2</sup>	2094	2724	8460	10,960
TURRET WT.	LBS.	38,837	38,500	40,300	40,440
TURRET INERTIA	SLUG FT. <sup>2</sup>	24,654	25,331	34,900	38,400
TURRET C.G.	IN.	-2.8	-2.5	-5.5	-6.6

+ REAR OF TURRET C.  
- FWD OF TURRET C.

39  
2.8  
31.2  
7.8  
109.2

# STABILIZATION SYSTEM

WEAPON	152MM XMI50	105MM M68	120MM LIIA2	120MM TI23E6
ELEVATION MECHANISM	NEW	NEW	NEW	NEW
HYDRAULIC POWER PACK	SAME	SAME	SAME	SAME
ELEVATION AMPLIFIER	REVISE	REVISE	REVISE	REVISE
AZIMUTH AMPLIFIER	REVISE	REVISE	REVISE	REVISE
GUNNERS/COMMANDERS CONTROLS	SAME	SAME	SAME	SAME
TRAVERSE MECHANISM	REVISE	REVISE	REVISE	REVISE
MANUAL TRAVERSE	SAME	SAME	SAME	SAME
TURRET LOCK	SAME	SAME	SAME	SAME
ELEVATION SERVO MECHANISM	REVISE	REVISE	REVISE	REVISE
AZIMUTH SERVO MECHANISM	REVISE	REVISE	REVISE	REVISE

# FIRE CONTROL

WEAPON	152MM XMI50	105MM M68	120MM LIIA2	120MM TI23E6
XMI26 TELESCOPE	SAME	⊕	⊕	⊕
XMI53 TELESCOPE MOUNT	SAME	NEW	NEW	NEW
XM50 GUNNERS PERISCOPE	SAME	SAME	SAME	SAME
XM50 DATA LINK	SAME	SAME	SAME	SAME
SYNCHRO (DATA LINK)	SAME	SAME	⊕	⊕
XMI9 COMPUTER SYSTEM	REVISE	REVISE	REVISE	REVISE
COMPUTER UNIT	⊖	⊖	⊖	⊖
GUNNERS PANEL	SAME	⊕	⊕	⊕
LASER RANGE FINDER	SAME	SAME	SAME	SAME
LASER CONTROL BOX	SAME	SAME	SAME	SAME

⊖ SLIGHT INTERFERENCE

⊖ INTERFERENCE

⊖ NEW AMMO PACKS

# TURRET ELECTRICAL SYSTEM

WEAPON	152MM XMI50	105MM M68	120MM LI1A2	120MM TI23E6
GUNNERS PANEL	SAME	REVISE	REVISE	REVISE
LOADERS PANEL	SAME	REVISE	REVISE	REVISE
NETWORKS BOX	SAME	REVISE	REVISE	REVISE
STABILIZATION BOX	SAME	REVISE	REVISE	REVISE
TURRET HARNESSSES	SAME	SOME ROUTING CHANGES		
GUN HARNESSSES	SAME	FIRING CIRCUIT REQD. ONLY		



# SYSTEMS/COMPONENTS

WEAPON:	152MM XMI50	105MM M68	120MM LI1A2	120MM TI23E6
G&C SYSTEM	SAME	NOT REQD.	NOT REQD.	NOT REQD.
CBSS SYSTEM	⊕	NOT REQD.	NOT REQD.	NOT REQD.

⊕ CHANGE IN GUN AREA

## GUN CHARACTERISTICS

WEAPON		152MM XMI50	105MM M68	120MM LHA2	120MM TI23E6
WEIGHT	LBS.	2630	2475	3926	4070
LENGTH	INS.	183.25	218.5	270.2	291.5
UNBALANCE DUE TO GUN	LB. INS.	63,500	76,000	120,000	156,000
RECOIL LENGTH	IN.	9 ✓	12	12	12
TRUNNION REACTION	LBS.	230,000	126,000	165,000	335,000
PROJECTILE WEIGHT	LBS.	19.35	12.75	22.75	50
PROJECTILE MUZZLE VELOCITY	FT./SEC.	4900	4850	4500	3500
MUZZLE ENERGY	FT. LBS.	7,210,000	4,740,000	7,190,000	9,500,000